

Section 8

Watershed Characterization Reports

The BASINS system includes tools designed to assist in summarizing key watershed information in a format suitable for preparing watershed characterization reports. These tools can be used to make an inventory and characterize both point and nonpoint sources at the watershed and subwatershed scales. The tools' functions include generation of customized maps and tables summarizing the overall condition of the study area.

Watershed characterization is key to understanding water quality issues and pollution sources in the watershed. In addition to evaluation of the watershed condition, it provides the necessary information to assess monitoring programs, identify data gaps, and develop watershed-water quality modeling strategies.

BASINS version 2.0 provides users the capability to generate six different types of watershed characterization reports:

- Point Source Inventory Report
- Water Quality Summary Report
- Toxic Air Emission Report
- Landuse Distribution Report
- State Soil Characteristics Report
- Watershed Topographic Report

The customized maps and tables that compose these reports are stored in a directory called `\Basins\WcReport\<StudyArea>\Reports\`, in which the `<StudyArea>` is the user-defined name or identifier of the study area. This study area name corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area. By default, when a user uses the 8-digit cataloging unit as the basis for defining the study area (without delineating a new subwatershed within the 8-digit cataloging unit), the study area is assigned the name "catalogi" based on the theme name Cataloging Unit Boundary in the View Table of Contents. When generating a report for the first time, the user is provided the option to select another name to replace the default study area name.

The files stored in the `\Reports` directory are of two types—text file (*.txt, *.tx1, *.tx2) and image file (*.wmf)—which, respectively, contain the tabular and map information about the selected watershed characteristic. These files can be directly imported into any standard word processor for further formatting and incorporation into other watershed characterization reports.

8.1 Point Source Inventory Report

Purpose

Point Source Inventory Report provides a summary of discharge facilities in a given watershed. The report relies on the EPA Permit Compliance System (PCS) database to identify permitted facilities in the selected study area and summarizes their discharge loading for a given pollutant. A discharge loading summary is provided for a given year. BASINS version 2.0 includes annual point source loading data for the period of 1991 to 1996.

Application

Point Source Inventory Report is a useful tool for characterizing pollutant loadings in a given watershed. Potential applications of this report tool include rapid identification of point sources, a mapping function to display the geographical distribution of point sources in the study area, and evaluation of their proximity to major streams (streams in Reach File, V1). The inventory and summary of loading discharges also allow the user to perform a planning-level assessment of the magnitude and severity of point source contributions. Generating this report for various years can provide information to evaluate the changes of point sources over time and support trend analysis.

Procedures

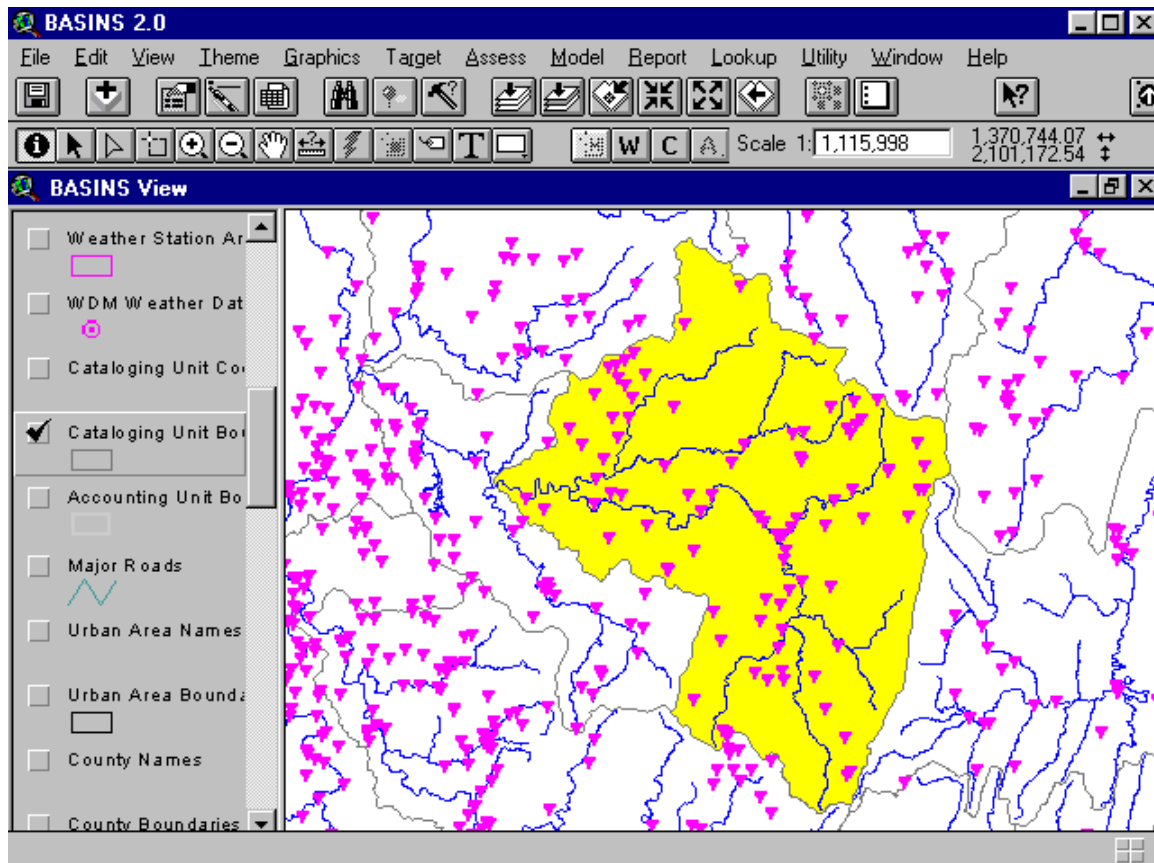
Key Procedures

- ✓ *Activate the watershed boundary theme*
- ✓ *Select the watersheds for which the report will be generated*
- ✓ *Under the Report main menu, select the Point Sources Inventory Report submenu*
- ✓ *Select the discharge year, pollutant of interest, and map option in the dialog box*



Operation Steps

1. In the BASINS View table of contents (Screen 8.1.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme may be the cataloging Unit boundary theme or a user delineated watershed boundary theme.



Screen 8.1.1

2. Activate the **Select Feature** tool and select (by clicking or dragging a box) the watershed(s) for which the Point Source Inventory Report will be generated.

Tip: The **Select Feature** tool allows you to drag a box over a group of features you want to select. Features that fall partly or wholly inside the box you define are selected. To select features that are not adjacent to one another, hold down the SHIFT key and select as many nonadjacent features as you want. By default, selected features are highlighted in yellow on your view.

3. Under the *Report* main menu, select the *Point Sources Inventory Report* submenu. In the dialog that appears (Figure 8.1.2), select the discharge year and monitoring (pollutant) parameter from the list

boxes provided. Click the check box if a location map of point sources is to be generated. You may choose to enter the map title in the text box provided.

Screen 8.1.2

4. Click **OK** to generate the report; otherwise, click **Cancel** to quit the tool without generating the report.

TUTORIAL

- Click the theme *Cataloging Unit Boundaries* to make it active.
- Check its check box to display the boundary theme in the View Window.
- Check the check box of the theme *Permit Compliance System* to display the location of the PCS stations.
- Using the **Select Feature** tool, select watershed 05010007. Your BASINS screen should now look like Screen 8.1.1. If necessary, zoom to the study area using the **Zoom to Selected Theme** tool.
- Under the Report main menu, select the Point Sources Inventory Report submenu.
- In the dialog box that appears (Screen 8.1.2), select year 1995 and parameter 5-day BOD, and enter the title 5-Day BOD Point Sources.
- Click **OK** to continue.
- Click **OK** to accept the default directory Catalogi where all report files will be saved. The report files pcs.* are saved at the \Basins\WcReport\Catalogi\Reports\ directory.



Generated Report

The generated report includes two tables and a map layout. The first table, "Point Source Inventory - Summary by subwatershed" (Screen 8.1.3), provides a complete list of all discharge facilities within the watershed(s) and pertinent information such as location (city, subwatershed, and reach number), status (major vs. minor facility), and Standard Industrial Classification (SIC) number. The second table, "Point Source Load - Summary by subwatershed," provides the list of discharge facilities that actually discharged the selected pollutant for the given year (Screen 8.1.4).

Point Source Inventory - Summary by subwatershed

Table xx. Point source inventory within the selected study area (PCS, 1995).

NPDES	Facility Name	City	Status	SIC	Reach File, V1
Subwatershed: 05010007					
PA0096946	ALEXANDER, RICHARD & BELINDA	68440	minor	495	
PA0205435	BENNY, JOSEPH & MARGARET	76020	minor	495	
PA0205541	BESTFORM FOUNDATIONS INC	18090	minor		
PA0002992	BETHLEHEM STEEL CORP-JOHNSTO	40800	minor	331	05010007006
PA0004499	BLAIRSVILLE MACHINE PROD CO	07000	minor	379	05010007002
PA0215856	BLAIRSVILLE MUN AUTH	07010	minor	494	
PA0217107	BRW STEEL CORP	40800	minor		
PA0096539	BURRELL FOOD SYSTEMS, INC	10580	minor	495	
PA0204331	BURRELL TWP SEW AUTH	10580	minor	495	
PA0204153	CAMBRIA COGEN CO	11170	minor	491	
PA0095273	CASTLE GAS COMPANY INC	10580	minor	347	
PA0204072	CHARLTON, THOMAS	81760	minor	495	
PA0056715	CLARK, ROBERT	46880	minor	495	
PA0090140	CLYMER BOROUGH MUN AUTH	14840	minor	495	05010007017
PA0204188	CONEMAUGH TWP AREA SCHOOL DI	19280	minor	821	
PA0216399	CONEMAUGH TWP MUN AUTH	40360	minor	494	
PA0217301	CONEMAUGH TWP SUPERVISORS	15910	minor		
PA0097985	DOLAN ENTERPRIZES, INC.	39840	minor	495	
PA0022292	EBENSBURG BORO MUN AUTH	23160	MAJOR	495	05010007010
PA0098612	EBENSBURG POWER COMPANY	11170	minor	491	
PA0217336	EMERALD ESTATES INC	11190	minor		
PA0205630	ENERGY CENTER, INC.	06880	minor		
PA0044431	FAIRFIELD MANOR, INC.	07720	minor	495	05010007002

Screen 8.1.3

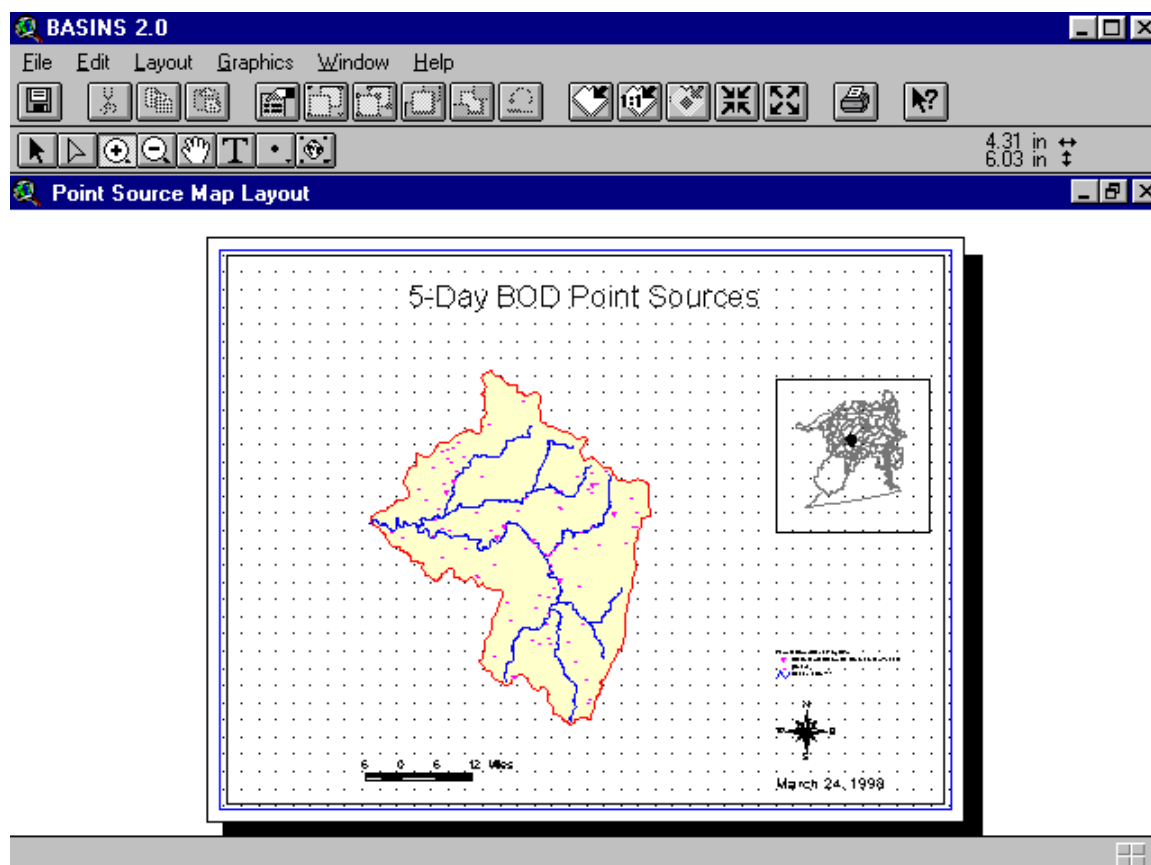
Point Source Load - Summary by subwatershed

Table xx. BOD, CARBONACEOUS 05 DAY, 20C load within the selected study area (PCS, 1995).

Reach File, V1	NPDES	Facility Name	Mile Point	Load (lbs/yr)
Subwatershed: 05010007				
05010007002	PA0026034	JOHNSTOWN CITY	29.6	1627414.8
05010007003	PA0002054	PENELEC - SEWARD GENERATING		0.0
05010007003	PA0026778	WINDBER AREA AUTH	8.1	252092.3
05010007010	PA0022292	EBENSBURG BORO MUN AUTH	14.3	74416.5
05010007010	PA0032611	PORTAGE AREA SEW AUTH	20.0	68728.3
05010007015	PA0005011	PENELEC CONEMAUGH		1151.3
05010007015	PA0005037	GPU/GENCO-HOMER CITY GENERAT	3.5	2994.3
05010007017	PA0001716	FMC CORP		194.4
Total Number of Facilities: 8				

Screen 8.1.4

The map layout shows the locations of all discharge facilities within the watershed(s) (Screen 8.1.5). Different map symbols are used to distinguish the facilities that discharged the selected pollutant for the given year from those facilities that did not. The Reach File network (RF1 or RF3) is also drawn in the map for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.



Screen 8.1.5

When the map layout is active, it can be printed through the *Print* submenu under the *File* main menu. Another way to print the map layout is through the **Print** button in the Project Window with the Layouts component selected and the “Point Source Map Layout” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout of the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.



Tip: The files *pcs.tx1* and *pcs.tx2*, which contain the tables, and *pcs.wmf*, which contains the point source map, are located in the `\Basins\WcReport\<StudyArea>\Reports\` directory. The `<StudyArea>` is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.

Tip: The subwatershed ID listed in the reports corresponds to the unique ID number automatically assigned to the subwatershed by the delineation tool or watershed boundary import utility. The subwatershed ID corresponds to a cataloging unit number (eg. 05010007) if the report generator was run using the cataloging unit theme or an RF1 or RF3 segment ID for user delineated or imported watershed boundary themes (eg. RF1 = 05010007020 or RF3 = 5010007_035_4.93).

8.2 Water Quality Summary Report

Purpose

Water Quality Summary Report provides a summary of water quality monitoring stations within the selected watershed that monitored a particular pollutant during a given time period. The water quality data are presented as statistical summaries of the mean and selected percentiles of the observed data. The data were originally obtained from USEPA's Storage and Retrieval System (STORET). The information generated in this report is summarized in table format and, if selected, in a map format.

Application

The **Water Quality Summary Report** generates information for characterizing water quality conditions of water bodies within a given watershed and can be used to support various watershed assessment and evaluation programs. Potential applications include review of existing monitoring programs, evaluation of ongoing monitoring activities, location of key stations with sufficient and relevant monitoring data for model calibration, and evaluation of data gaps. Although the information is summarized statistically, it can provide basic information to assess the conditions of a given water body, as well as to evaluate its changes over time.

Procedures

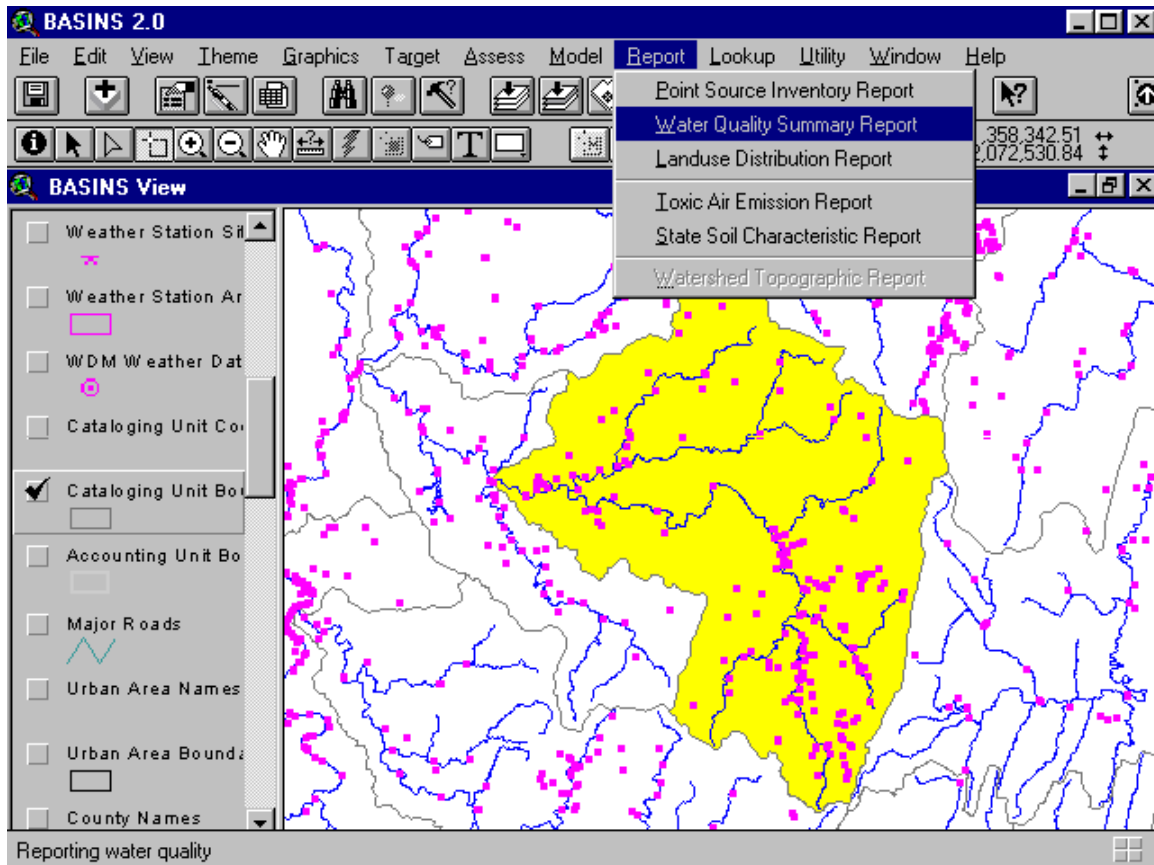
Key Procedures

- ✓ *Activate the watershed boundary theme*
- ✓ *Select the watersheds for which the report will be generated*
- ✓ *Under the Report main menu, select the Water Quality Summary Report submenu*
- ✓ *Select the time period, pollutant, and map option in the dialog box*



Operation Steps

1. In the BASINS View table of contents (Screen 8.2.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 8.2.1

2. Activate the **Select Feature** tool and select (by clicking or dragging a box) the watershed for which the Water Quality Summary Report will be generated.
3. Under the *Report* main menu, select the *Water Quality Summary Report* submenu. In the dialog (Screen 8.2.2) that appears, select the time period(s) from the check boxes and monitoring (pollutant) parameter from the list box provided in the dialog. Several time periods can be checked at one time. Click the check box if a location map of water quality monitoring stations is to be generated. You may choose to enter the map title in the text box provided.

Screen 8.2.2

4. Click **OK** to generate the report; otherwise, click **Cancel** to quit the tool without generating the report.

TUTORIAL

- Click the theme *Cataloging Unit Boundaries* to make it active.
- Check its check box to display the boundary theme in the View Window.
- Check the check box of the theme *Water Quality Station* to display the location of the water quality stations.
- Using the **Select Feature** tool, select watershed 05010007. Your BASINS screen should now look like Screen 8.2.1. If necessary, zoom to the study area using the **Zoom to Selected Theme** tool.
- Under the Report main menu, select the Water Quality Summary Report submenu.
- In the dialog box that appears (Screen 8.2.2), select the time periods 1975-1979 and 1985-1989 and the parameter Dissolved Oxygen, and enter the title Dissolved Oxygen.
- Click **OK** to continue.
- Click **OK** to accept the default directory Catalogi where all report files will be saved. The report files wq.* are saved at the \Basins\WcReport\Catalogi\Reports\ directory.



Generated Report

The generated report includes several tables and a map layout. The first table, “Water Quality Station Inventory - Summary by Subwatershed” (Screen 8.2.3), provides a complete list of all water quality monitoring stations within the watershed(s) and pertinent information such as county location, river basin, and reach location. Not all of the water quality stations listed in the table might actually have monitored the selected pollutant for the given time period. The second set of tables, “Water Quality Summary - by Station” (Screen 8.2.4), contain the water quality stations that actually monitored the selected pollutant for the given time period(s). Each table is associated with a different water quality station and shows the statistics of the observed data for each time period selected.

Agency	Station No.	Location	County	Watershed	Seg	No of Obs (OXYGEN, DISSOLV)
03039200	112WRD	CLEAR RUN NEAR BUCKSTOWN, PA	SOMERSET	05010007		0
03039300	112WRD	WELLS C AT MOSTOLLER, PA	SOMERSET	05010007		0
03039340	112WRD	BEAVERDAM C AT STOYSTOWN, PA	SOMERSET	05010007		0
03039420	112WRD	NORTH BRANCH QUEMAHONING CR	SOMERSET	05010007		0
03039440	112WRD	QUEMAHONING C AT BOSWELL, PA	SOMERSET	05010007		0
03039700	112WRD	DARK SHADE CR. AT CENTRAL CI	SOMERSET	05010007		0
03039750	112WRD	DARK SHADE C AT REITZ, PA	SOMERSET	05010007		0
03039800	112WRD	CLEAR SHADE CR AT OGLETOWN,	SOMERSET	05010007	009	0
03039920	112WRD	LITTLE PAINT CREEK AT SCALP	CAMBRIA	05010007		0
03039925	112WRD	NORTH FORK BENS CR AT NORTH	SOMERSET	05010007		0
03039926	112WRD	NORTH FORK BENS CR AT N.F. R	SOMERSET	05010007		0
03039930	112WRD	SOUTH FORK BENS CR NR THOMAS	SOMERSET	05010007		0
03039931	112WRD	SOUTH FORK BENS CR NR THOMAS	SOMERSET	05010007		0
03039950	112WRD	S FK BENS C NR FERNDAL, PA	SOMERSET	05010007		0
03039957	112WRD	BENS C AT FERNDAL, PA	SOMERSET	05010007		0
03040000	112WRD	STONYCREEK RIVER AT FERNDAL	CAMBRIA	05010007		5
03040100	112WRD	L CONEMAUGH RIVER AT WILMORE	CAMBRIA	05010007		0
03040110	112WRD	HOWELLS RUN NEAR EBENSBURG,	CAMBRIA	05010007		0
03040511	112WRD	S FORK AT SOUKSBURG, PA	CAMBRIA	05010007		0
03041025	112WRD	LITTLE CONEMAUGH RIVER AT JO	CAMBRIA	05010007	010	5
03041028	112WRD	HINCKSTON RUN AT MINERSVILLE	CAMBRIA	05010007	002	0
03041500	112WRD	CONEMAUGH RIVER AT SEWARD, P	WESTMORELAND	05010007		5
03041650	112WRD	HENDRICKS C NR WEST FAIRFIEL	WESTMORELAND	05010007	002	0
03041675	112WRD	TOMS RUN NEAR BLAIRSVILLE, P	INDIANA	05010007		0
03041700	112WRD	MCGEE RN AT BRENZER, PA	WESTMORELAND	05010007	002	0
03041710	112WRD	DUTCH RUN NEAR BLUE GOOSE, P	CAMBRIA	05010007		0
03041720	112WRD	ELK CREEK NEAR BELSANO, PA	CAMBRIA	05010007		0
03041800	112WRD	SOUTH BRANCH BLACKLICK CREEK	CAMBRIA	05010007		0
03041800	112WRD	DUTCH CREEK AT STACHOW, PA	INDIANA	05010007		0

Screen 8.2.3

The map layout shows the locations of all water quality monitoring stations within the watershed(s) (Screen 8.2.5). Different map symbols are used to distinguish the facilities that monitored the selected pollutant for the given time period from those facilities that did not. The Reach File network (RF1 or RF3) is also drawn in the map for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

When the map layout is active, it can be printed through the *Print* submenu under the *File* main menu. The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout of the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.

Water Quality Summary --by Station

Table xx. Water Quality Summary for 112WRD Station No.03040000: OXYGEN, DISSOLVED (Units: MG/L).
(Location: STONYCREEK RIVER AT FERNDAL, PA., CAMBRIA, Watershed: 05010007, Reach Segment:).

Years	No of Obs	Mean	25th %	50th %	75th %
1975 - 1979	5	7.20	6.50	7.00	8.00
1985 - 1989	NO DATA				

End of Table

Table xx. Water Quality Summary for 112WRD Station No.03041025: OXYGEN, DISSOLVED (Units: MG/L).
(Location: LITTLE CONEMAUGH RIVER AT JOHNSTOWN, PA., CAMBRIA, Watershed: 05010007, Reach Segment:).

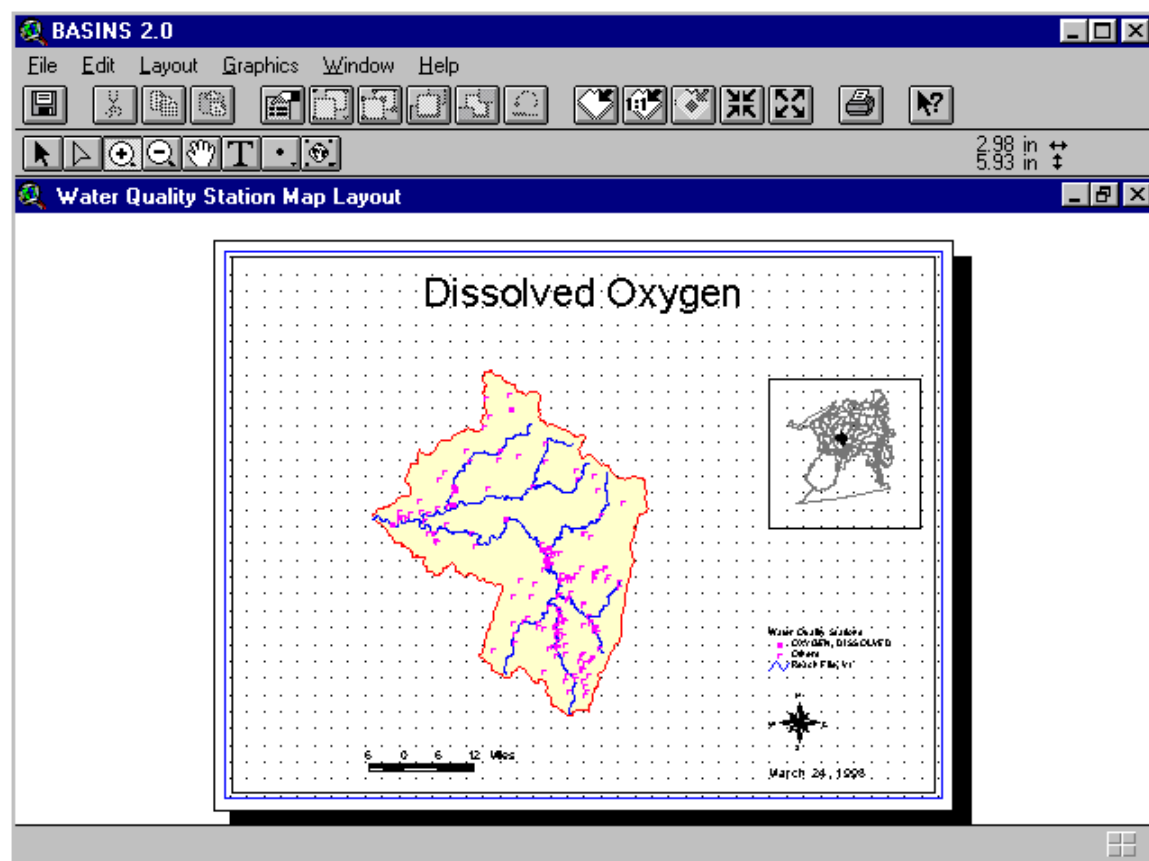
Years	No of Obs	Mean	25th %	50th %	75th %
1975 - 1979	5	8.60	8.00	9.00	9.00
1985 - 1989	NO DATA				

End of Table

Table xx. Water Quality Summary for 112WRD Station No.03041500: OXYGEN, DISSOLVED (Units: MG/L).
(Location: CONEMAUGH RIVER AT SEWARD, PA. SITE 31, WESTMORELAND, Watershed: 05010007, Reach Segment:).

Years	No of Obs	Mean	25th %	50th %	75th %
1975 - 1979	5	11.00	9.25	12.00	12.00
1985 - 1989	NO DATA				

Screen 8.2.4



Screen 8.2.5



The tables and the map are developed for the purpose of integrating them into a single document. A standard word processor can be used to import both the tables and the map for further editing and formatting.

Tip: The files *wq.tx1* and *wq.tx2*, which contain the tables, and *wq.wmf*, which contains the location map of the water quality stations, are located in the `\Basins\WcReport\<StudyArea>\Reports\` directory. The `<StudyArea>` is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.

8.3 Toxic Air Emission Report

Purpose

Toxic Air Emission Report provides a summary of facilities that are part of the Toxic Release Inventory (TRI) and have estimated air releases of a particular pollutant in a selected watershed.

Application

Information generated in **Toxic Air Emission Report** can be used to support the characterization of emission sources in a given watershed. It generates tabular summaries of TRI facilities with their corresponding estimates of pollutant air releases and other pertinent information such as facility identification name, city location, status (active or inactive facility), ownership type (government, commercial), and SIC code number. Together with other reports generated in BASINS, such as point source discharges, land use distribution, and water quality summary, this report can support analysis of the relative magnitude of air emissions in the overall watershed loading. This report also generates a map showing the location of the TRI facilities overlaid with the Reach File network (i.e., RF1) and the boundary of the selected watershed.

Procedures

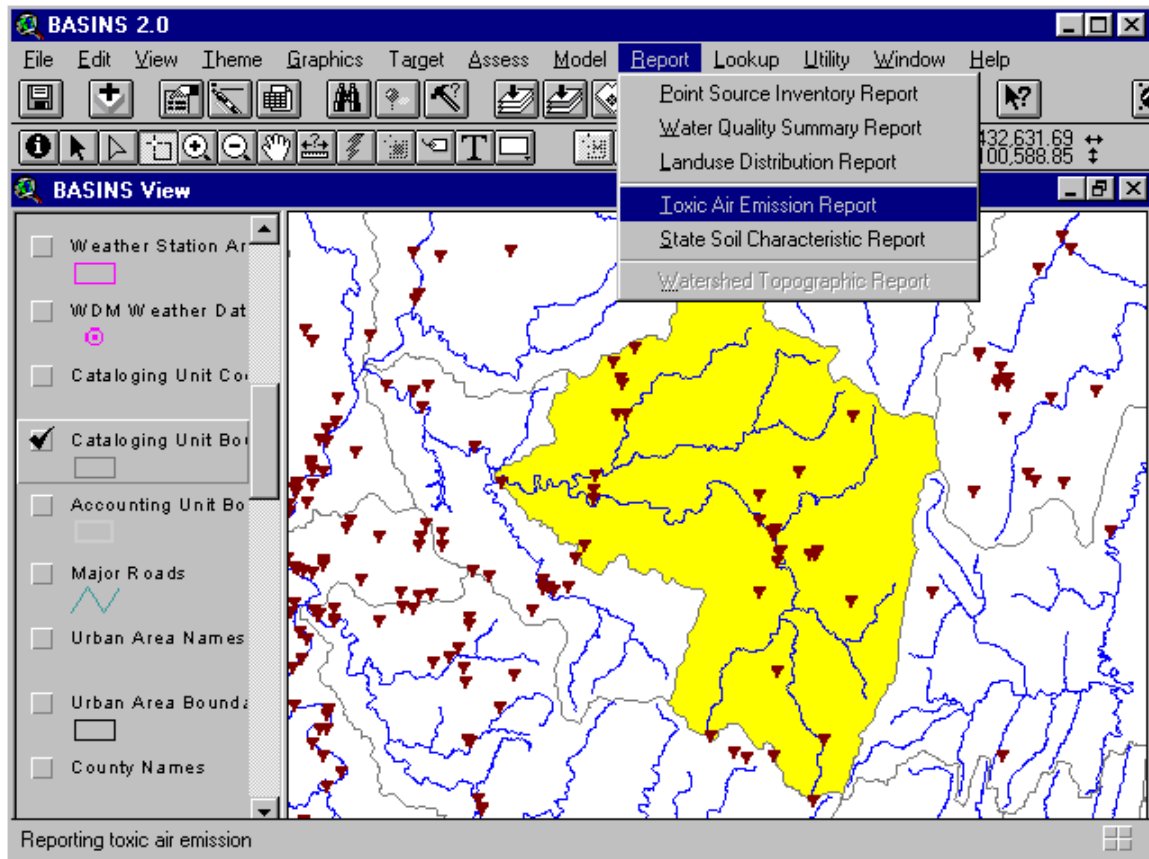
Key Procedures

- ✓ *Activate the watershed boundary theme*
- ✓ *Select the watersheds for which the report will be generated*
- ✓ *Under the Report main menu, select Toxic Air Emission Report submenu*
- ✓ *Select the toxic release year, pollutant type, and the map option in the dialog box*



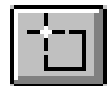
Operation Steps

1. In the BASINS View table of contents (Screen 8.3.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 8.3.1

2. Activate the **Select Feature** tool and select (by clicking or dragging a box) the watershed(s) for which the Toxic Air Emission Report will be generated.
3. Under the *Report* main menu, select the *Toxic Air Emission Report* submenu. In the dialog box that appears (Figure 8.3.2), select the toxic release year and monitoring (pollutant) parameter in the list boxes provided. Click the check box if a location map of TRI facilities is to be generated. You may choose to enter the map title in the text box provided.



Please select release year and monitoring parameters. Enter a title if you want to create a map.

Toxic Release Year: Toxic Air Emission 1992

Monitoring Parameter: 38

COPPER
ZINC (FUME OR DUST)
 HYDROCHLORIC ACID (1995 AND AFTER ACID AEROSOLS ONLY)
 PHOSPHORIC ACID
 HYDROGEN FLUORIDE
 AMMONIA
 SULFURIC ACID


☒ Create a Map (Title): Zinc (Fume or Dust) Air Emission

OK Cancel

Screen 8.3.2

- Click **OK** to generate the report; otherwise, click **Cancel** to quit the tool without generating the report.

TUTORIAL

- Click the theme *Cataloging Unit Boundaries* to make it active.
- Check its check box to display the boundary theme in the View window.
- Check the check box of the theme *Toxic Release Inventory* to display the location of the TRI facilities. Using the **Select Feature** tool, select watershed 05010007. Your BASINS screen should now look like Screen 8.3.1. If necessary, zoom to the study area using the **Zoom to Selected Theme** tool. 
- Under the Report main menu, select *Toxic Air Emission Report* submenu.
- In the dialog box that appears (Screen 8.3.2), select the year 1992 and parameter Zinc (Fumes and Dust), and enter the title Zinc (Fumes and Dust) Air Emission.
- Click **OK** to continue.
- Click **OK** to accept the default directory Catalog where all report files will be saved. The report files tri.* are saved at the |Basins|WcReport|Catalog|Reports| directory.



Generated Report

The generated report includes two tables and a map layout. The first table, “Toxic Air Inventory - Summary by subwatershed” (Screen 8.3.3), provides a complete list of all TRI facilities within the watershed(s) and pertinent information such as city location, status (active or inactive facility), type of ownership (government, commercial), and Standard Industrial Classification number. The second table, “Toxic Air Emission - Summary by subwatershed” (Screen 8.3.4), provides the list of TRI facilities that actually released the selected pollutant for the given year. The air releases are grouped into two types, stack and fugitive emissions. Stack emissions include releases that occur through stacks, vents, ducts, pipes, or other confined air streams, as well as storage tank emissions and air releases from air pollution control equipment. Fugitive emissions include equipment leaks from valves, pump seals, flanges, compressors, sampling connections, and open ended lines; evaporative losses from surface impoundments and spills; and releases from building ventilation systems.

Toxic Air Inventory - Summary by subwatershed

Table xx. Toxic air emission source inventory within the selected study area (TRI, 1992).

ID	Facility Name	City	SIC	Ownership	Status
Subwatershed: 05010007					
15501CRBS	PENN CARBOSE INC.	SOMERSET	2679	Commercial	Active
15501GLMR	GILMOUR MFG. CO.	SOMERSET	3089	Commercial	Active
15501MLTS	MULTI-SERVICE EQUIPMENT CORP	SOMERSET	3089	Commercial	Active
15501THCL	FLEETWOOD FOLDING TRAILERS I	SOMERSET	3792	Commercial	Active
15541WMFM	WAMPUM HARDWARE CO.	FREIDENS	2892	Commercial	Active
15563HGHL	HIGHLAND TANK & MFG. CO.	STOYSTOWN	3443	Commercial	Active
15601SSNL	SEASON-ALL IND. INC.	INDIANA	3442	Commercial	Inactive
15627CRNN	CRAIN IND. INC.	DERRY	3086	Commercial	Active
15627KYST	KEYSTONE FOAM CORP.	DERRY	3069	Commercial	Active
15627NDST	INDUSTRIAL CERAMICS INC.	DERRY	3264	Commercial	Inactive
15681BRZN	BREEZE INDUSTRIAL PRODUCTS	SALTSBURG	3429	Commercial	Active
15681FDRL	TRANSTECHNOLOGY CORP. FEDERA	SALTSBURG	2869	Commercial	Active
15701FSHR	FISHER SCIENTIFIC CO.	INDIANA	3821	Commercial	Active
15701MCCR	SPECIALTY TIRES OF AMERICA I	INDIANA	3011	Commercial	Active
15701SCHR	SCHROTH IND.	INDIANA	2491	Commercial	Active
15717BLRS	BLAIRSVILLE MACHINE PRODS. C	BLAIRSVILLE	3499	Commercial	Active
15717FMCC	FMC CORP. BLAIRSVILLE PLANT	BLAIRSVILLE	3535	Commercial	Active
15717WSTN	WESTINGHOUSE ELECTRIC CORP.	DERRY TOWNSHIP	3356	Commercial	Active
15748FMCC	FMC CORP. HOMER CITY PLANT	HOMER CITY	3535	Commercial	Active
15748STRM	STAR MFG. CO.	HOMER CITY	3448	Commercial	Active
15901SNDR	PENN TRAFFIC CO. SANI-DAIRY	JOHNSTOWN	2024	Commercial	Active
15902CCCK	KORNS GALVANIZING CO.	JOHNSTOWN	3429	Commercial	Active
15902JHNS	JOHNSTOWN CORP.	JOHNSTOWN	3325	Commercial	Active
15902SCMM	SCM METAL PRODS. INC.	JOHNSTOWN	3399	Commercial	Active
15904CLIK	CALLIKER DAIRY CO.	JOHNSTOWN	2024	Commercial	Active

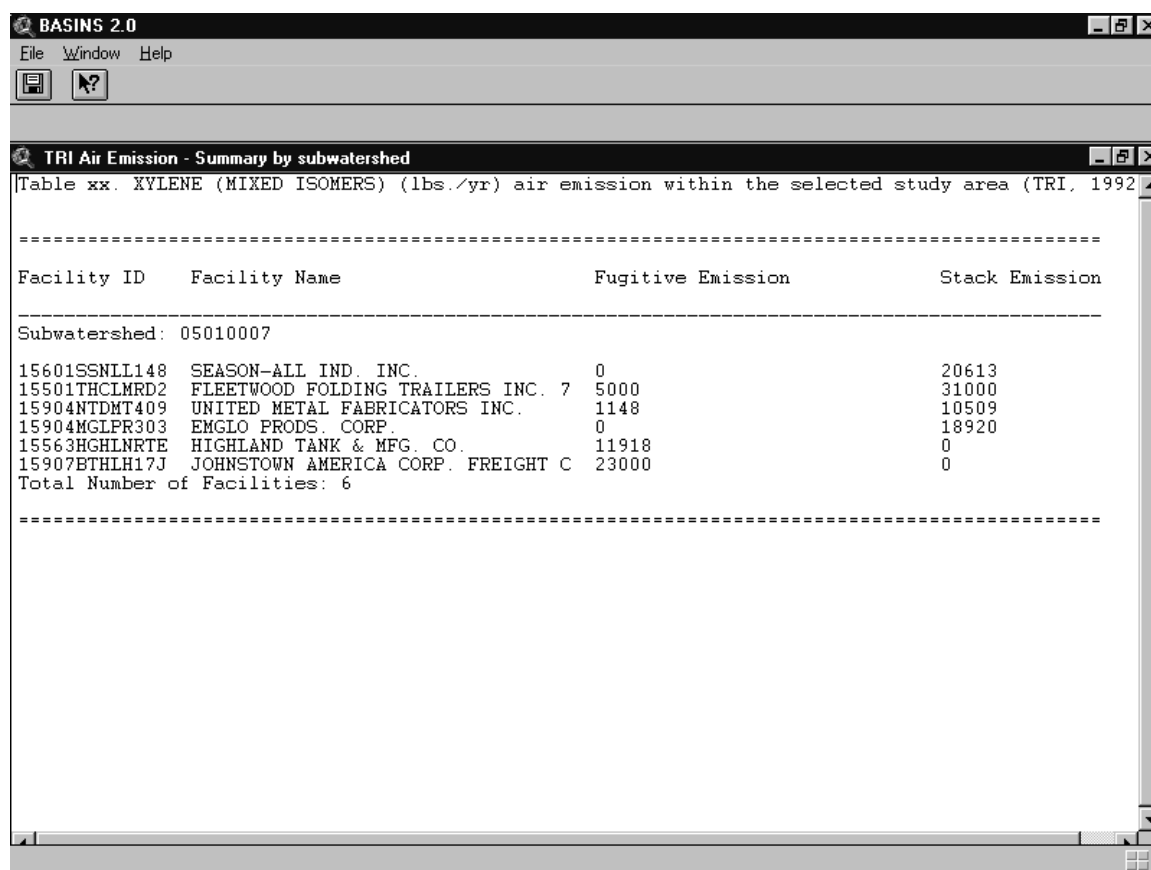
Screen 8.3.3

The map layout shows the location of all TRI facilities within the watershed(s) (Screen 8.3.5). Different map symbols are used to distinguish the facilities that released the selected pollutant for the given year from those facilities that did not. The Reach File network (RF1 or RF3) is also drawn in the map for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

When the map layout is active, it can be printed through the *Print* submenu under the *File* main menu. Another way to print the Toxic Air Emission map layout is through the **Print** button in the Project Window with the Layouts component selected and the “Toxic Air Emission Layout” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout of

the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.



BASINS 2.0
File Window Help

TRI Air Emission - Summary by subwatershed

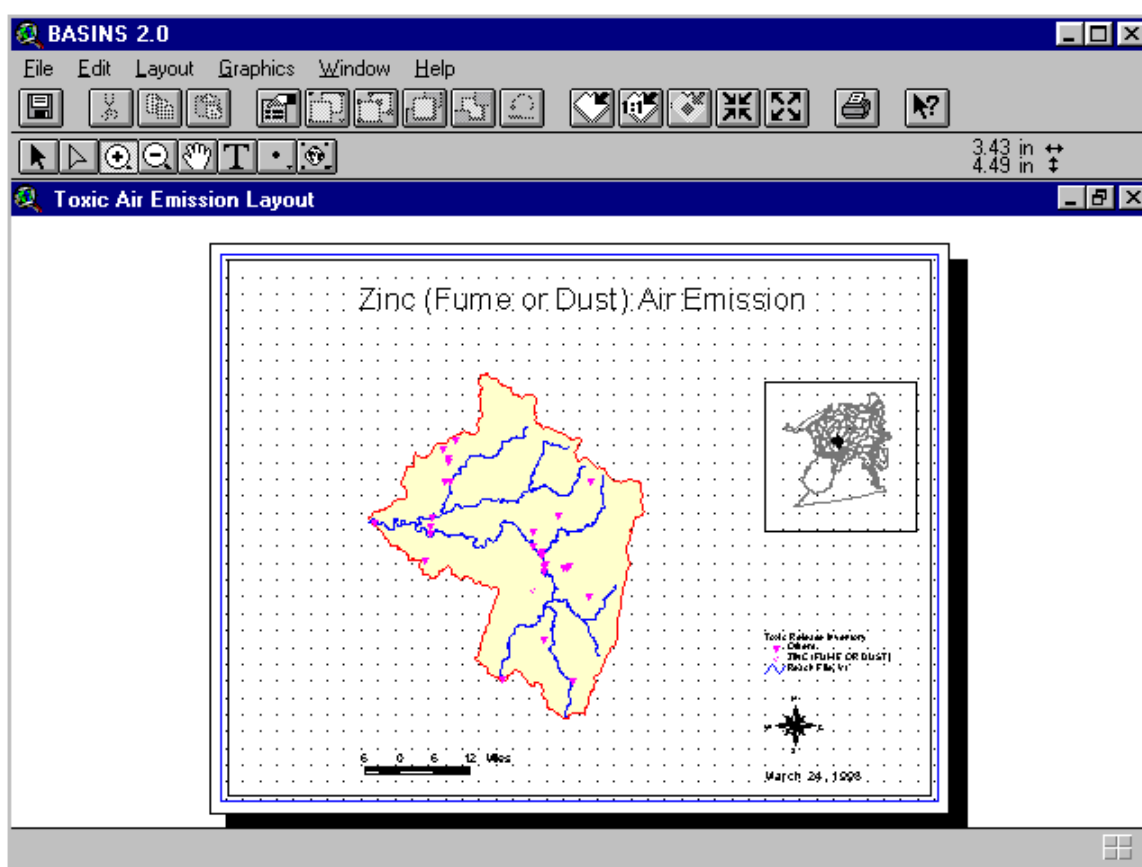
Table xx. XYLENE (MIXED ISOMERS) (lbs./yr) air emission within the selected study area (TRI, 1992)

=====

Facility ID	Facility Name	Fugitive Emission	Stack Emission
Subwatershed: 05010007			
15601SSNLI148	SEASON-ALL IND. INC.	0	20613
15501THCLMRD2	FLEETWOOD FOLDING TRAILERS INC. 7	5000	31000
15904NTDMT409	UNITED METAL FABRICATORS INC.	1148	10509
15904MGLPR303	EMGLO PRODS. CORP.	0	18920
15563HGHLNRTE	HIGHLAND TANK & MFG. CO.	11918	0
15907BTHLH17J	JOHNSTOWN AMERICA CORP. FREIGHT C	23000	0
Total Number of Facilities: 6			

=====

Screen 8.3.4



Screen 8.3.5

Tip: The files *tri.tx1* and *tri.tx2*, which contain the tables, and *tri.wmf*, which contains the location map of the TRI facilities, are located in the `\Basins\WcReport\<StudyArea>\Reports\` directory. The `<StudyArea>` is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.

8.4 Land Use Distribution Report

Purpose

Landuse Distribution Report provides a summary of the land use distribution within the selected watershed(s). The BASINS default land use data were originally obtained from the USGS Geographic Information Retrieval and Analysis System (GIRAS) and use the Anderson Level II classification. The information generated in this report is summarized in both table and map layout formats.

Application

Landuse Distribution Report can be used to examine the various land uses in the study area (by subwatershed) to assist in developing a modeling strategy such as the selection of nonpoint source segments (subwatershed) and the land use classes to be represented in the nonpoint source model. It can also be used to assess the need for a nonpoint source monitoring program and to determine areas where monitoring data are most useful for model parameterization and calibration. The report generates two tables. The first table is a tabular summary of the total acreage under each land use category (Anderson Level I classification). The second table provides the breakdown of the land use distribution in more detail using the Anderson Level II classification. The report also generates a map showing the land distribution within the watershed overlaid with the Reach File network (RF1) and the boundary of the selected watershed.

Procedures

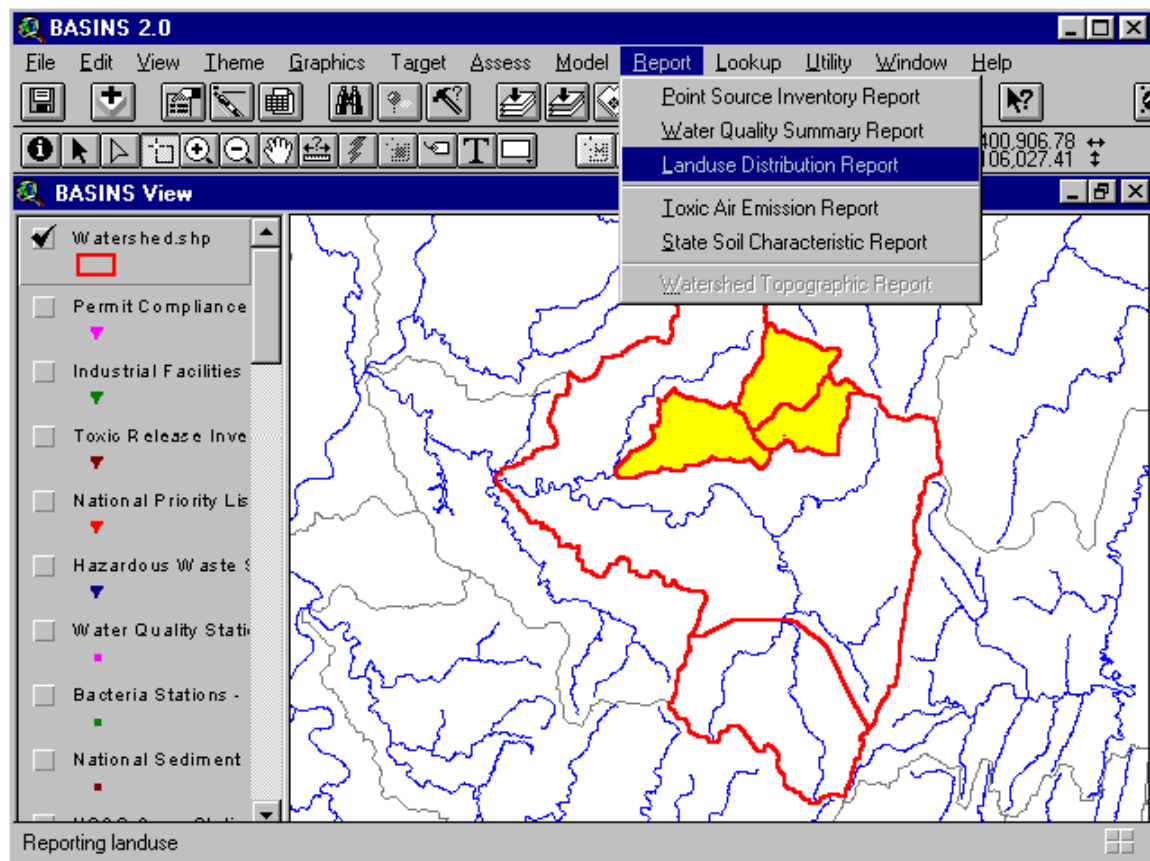
Key Procedures

- ✓ *Activate the watershed boundary theme*
- ✓ *Select the watershed for which the report will be generated*
- ✓ *Under the Report main menu, select the Landuse Distribution submenu*



Operation Steps

1. In the BASINS View table of contents (Screen 8.4.1), click the name of the appropriate watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 8.4.1

2. Activate the **Select Feature** tool and select (by clicking or dragging a box) the watershed for which the Land Use Distribution Report will be generated.
3. Under the *Report* main menu, select the *Land Use Distribution Report* submenu. In the dialog box that appears, enter the land use map title. Click **OK** to generate the report; otherwise, click **Cancel** to quit the tool without generating the report.

TUTORIAL

- Click the theme *Watershed.shp* to make it active. This demonstrates that the report tools can also be applied to user-delineated watersheds.
- Check its Check Box to display the boundary theme in the View Window.
- Using the **Select Feature** tool, select the three delineated subwatersheds. Your BASINS screen should now look like Screen 8.4.1. If necessary, zoom to the study area using the **Zoom to Selected Theme** tool.
- Under the Report main menu, select Land Use Distribution Report submenu.
- In the dialog box that appears, enter the title Land Use Distribution.
- Click **OK** to continue.
- Click **OK** to accept the default directory *Watershe* where all report files will be saved. The report files *landuse.** are saved at the *|Basins|WcReport|Watershe|Reports|* directory.

**Generated Report**

The generated report includes two tables and a map layout. The first table, “Land Use Information - Summary by Major Land Use Category” (Screen 8.4.2), contains the total acreage under major land use category. The second table, “Land Use Information - Summary” (Screen 8.4.3), contains the acreage under more detailed land use classification.

Landuse Information - Summary by Major Land Use Category				
Table xx. Land use distribution by major land use category.				
Sub-Watershed	05010007014	05010007013	05010007012	Total Area
Land Use Name and Code	Area (acres)	Area (acres)	Area (acres)	(acres)
Urban or Built-up Land	238	1810	450	2498
Agricultural Land	13605	3504	12018	29127
Forest Land	25684	24539	36030	86253
Water	58	87	0	145
Barren Land	592	267	1320	2180
Total	40177	30207	49818	120203

Screen 8.4.2



Land Use Information - Summary

Table xx. Detailed land use distribution.

Sub-Watershed	05010007014	05010007013	05010007012	Total Area
Land Use Name and Code	Area (acres)	Area (acres)	Area (acres)	(acres)
Urban or Built-up Land				
RESIDENTIAL-11	238	1034	280	1552
COMMERCIAL AND SERVICES-12	0	437	45	482
INDUSTRIAL-13	0	44	18	62
TRANS. COMM. UTIL-14	0	270	0	270
OTHER URBAN OR BUILT-UP-17	0	25	107	132
Subtotal	238	1810	450	2498
Agricultural Land				
CROPLAND AND PASTURE-21	13605	3504	12018	29127
Subtotal	13605	3504	12018	29127
Forest Land				
DECIDUOUS FOREST LAND-41	13313	16903	35602	65818
EVERGREEN FOREST LAND-42	10993	6509	428	17930
MIXED FOREST LAND-43	1378	1127	0	2505
Subtotal	25684	24539	36030	86253
Water				
RESERVOIRS-53	58	87	0	145
Subtotal	58	87	0	145
Barren Land				
STRIP MINES-75	592	267	1320	2180
Subtotal	592	267	1320	2180
Total	40177	20207	49818	120202

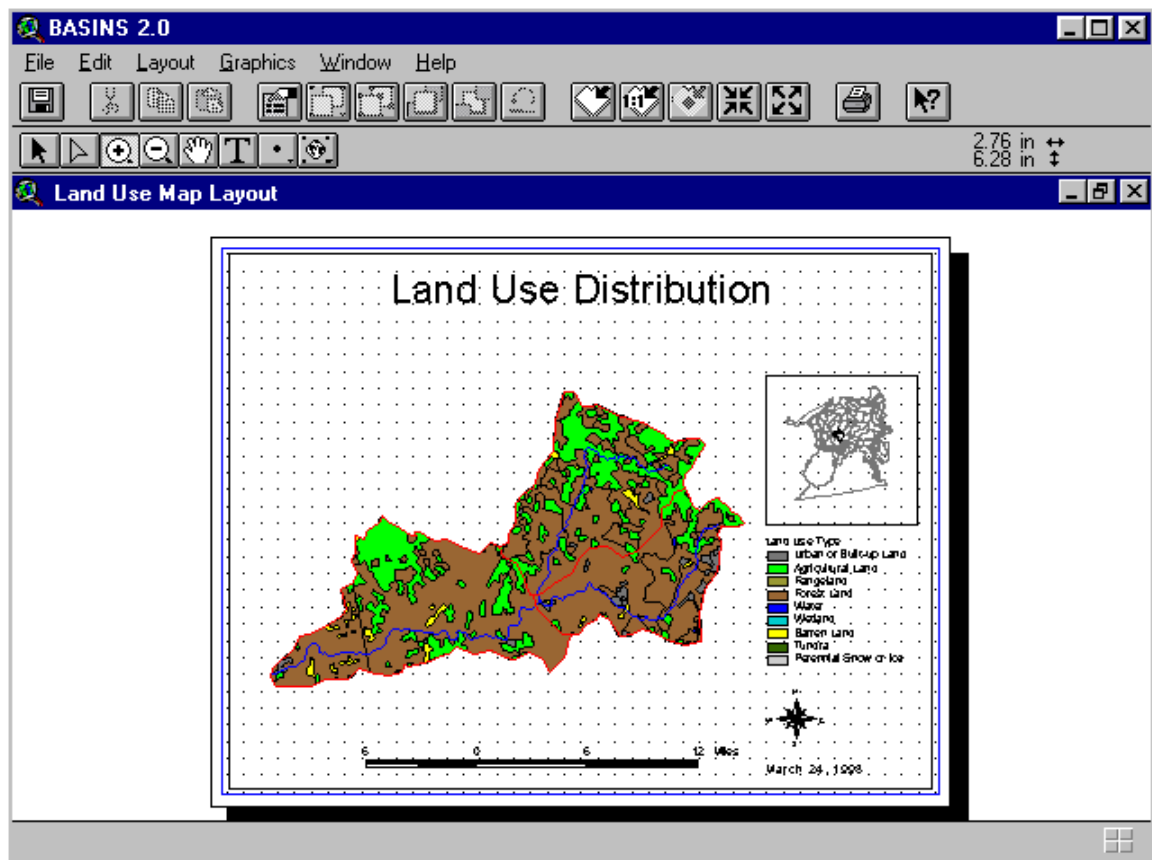
Screen 8.4.3

The map layout, "Land Use Map Layout" (Screen 8.4.4), shows the land use distribution using the major land use categories. The Reach File network (RF1 or RF3) is also drawn in the map layout for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

When the map layout is active, it can be printed through the *Print* submenu under the *File* main menu. The map can also be imported into a document using a word processor.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate an acceptable printout for the BASINS tables, particularly when the tables are large. It is recommended that you import the content of the tables using a word processor.

Tip: The files *landuse.tx1* and *landuse.tx2*, which contain the tables, and *landuse.wmf*, which contains the land use map, are located in the `|Basins|WcReort|<StudyArea>|Reports|` directory. The `<StudyArea>` is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.



Screen 8.4.4

8.5 State Soil Characteristic Report

Purpose

State Soil Characteristic Report provides a summary of the spatial variability of selected soil parameters within one or a set of subwatersheds. The soil parameters considered include water table depth, bedrock depth, soil erodibility, available water capacity, permeability, bulk density, pH, organic matter content, soil liquid limit, soil plasticity, percent clay content, and percent silt and clay content. The data were originally obtained from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) State Soil and Geographic Database (STATSGO). The information generated in this report is summarized in table format and, if selected, presented in map format.

Application

State Soil Characteristic Report is a useful tool for characterizing the spatial variability of soil within the selected watershed(s). The soil data were originally obtained from the STATSGO database, which breaks down an area coverage into smaller georeferenced units called map units. Each map unit is further broken down into soil components and layers.

Soil parameter values are calculated by STATSGO map units and by subwatershed through a combination of aggregation methods such as area-weighting and depth integration. The parameter value for a particular map unit can also be selected so that it corresponds to the value of the largest soil component within the map unit (e.g., mode method) and/or to the value of the soil surface layer. The calculation can be based on the minimum, maximum, or mean values of the soil parameters available in the STATSGO database.

The soil report generates a table of aggregated values of the selected parameter by STATSGO map unit and by subwatershed. It also generates maps showing the spatial variability of the selected soil parameter by map unit and by subwatershed overlaid with the Reach File network (RF1) and the boundary of the selected watershed.

Procedures

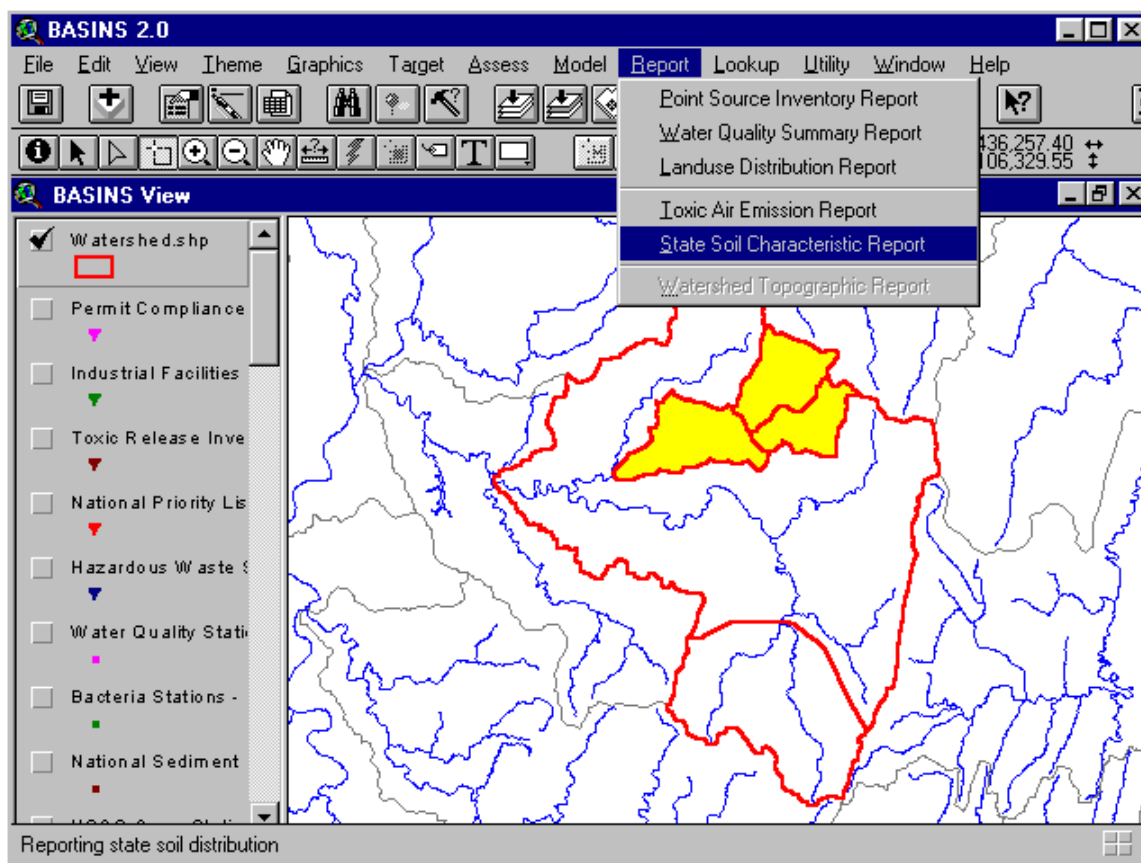
Key Procedures

- ✓ Activate the watershed boundary theme
- ✓ Select the watersheds for which the report will be generated
- ✓ Under the Report main menu, select the State Soil Characteristic Report submenu
- ✓ Select the soil parameter, type of estimate, aggregation method, and map option in the dialog box



Operation Steps

1. In the BASINS View table of contents (Screen 8.5.1), click the name of the watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 8.5.1

2. Activate the **Select Feature** tool and select (by clicking or dragging a box) the watershed(s) for which the soil report will be generated.
3. Under the *Report* main menu, select the *State Soil Characteristic Report* submenu. In the dialog box that appears (Screen 8.5.2), select the soil parameter from the list box and the type of estimate, component aggregation method, and (if necessary) layer aggregation method through the check boxes. Click the check box if soil maps are to be generated. You may choose to enter the map title in the text box provided.

For soil parameters that do not vary with depth, such as water table and bedrock depths, only soil component aggregation is required to obtain the “representative” values by map units. You may choose the area-weighted method of aggregating the soil components within a map unit to obtain the “representative” value. On the other hand, you may choose the value of the largest soil component within the map unit as the “representative” value for the entire map unit.

Report Generator - Soil

Parameter: Permeability (in/hr)

Type of Estimate

- ☒ Mean
- ☐ Low
- ☐ High

Component

- ☒ Area-weighted
- ☐ Mode

Layer

- ☒ Depth-integration
- ☐ Surface Layer

☒ Create a Map (Title): Soil Permeability

OK Cancel

Screen 8.5.2

For the rest of the soil parameters that also vary with depth (soil layers) such as soil erodibility, available water capacity, permeability, bulk density, pH, organic matter content, soil liquid limit, soil plasticity, percent clay content, and percent silt and clay content, an extra step of layer aggregation is required to obtain a “representative” value for all soil layers. You may choose the depth-integration (depth-weighted) method of aggregating the soil layers of a particular soil component within the map unit. On the other hand, you may choose the value associated with the surface soil layer as the “representative” value for all soil layers.

For the soil parameters supported in this report tool, the STATSGO database reports both minimum and maximum values. This provides the user an option of generating the soil characterization report based on minimum, maximum, or mean (of the minimum and maximum) values.

- Click **OK** to generate the report; otherwise, click **Cancel** to quit the tool without generating the report.

TUTORIAL

- Click the theme *Watershed.shp* to make it active. This demonstrates that the report tools can also be applied to user-delineated watersheds.
- Check its check box to display the boundary theme in the View window.



TUTORIAL (cont)

- Using the **Select Feature** tool, select the three delineated subwatersheds. Your BASINS screen should now look like Screen 8.5.1. If necessary, zoom to the study area using the **Zoom to Selected Theme** tool.
- Under the Report main menu, select the State Soil Characteristic Report submenu.
- In the dialog box that appears (Screen 8.5.2), select Parameter Permeability and Options Mean, Area-Weighted and Depth-Integration.
- Enter the title Soil Permeability.
- Click **OK** to continue.
- Click **OK** to accept the default directory Watershe where all report files will be saved. The report files soil.* are saved at the |Basins|WcReport|Watershe|Reports| directory.

Generated Report

The generated report includes two tables and two map layouts. The first table, “State Soil Report - Summary by subwatershed” (Screen 8.5.3), contains the acreage of the STATSGO map unit and the corresponding aggregated values of the selected parameter. The second table, “State Soil Statistics - Summary by subwatershed” (Screen 8.5.4), contains the total acreage of the subwatershed and the mean, maximum, and minimum of the map unit values within the subwatershed.

State Soil Report - Summary by subwatershed		
Table xx. Soil distribution by STATSGO Map Unit.		
Map Unit	Area (acre)	Permeability (in/hr)
Subwatershed: 05010007014		
PA022	28180	9.33
PA053	11312	0.77
PA056	685	0.77
Subwatershed: 05010007013		
PA022	21772	9.33
PA053	57	0.77
PA056	8378	0.77
Subwatershed: 05010007012		
PA022	29551	9.33
PA053	18023	0.77
PA055	2245	1.17
Note: Type of Estimate: Mean; Components: Area-weighted; Layers: Depth-integration.		

Screen 8.5.3

State Soil Statistics - Summary by subwatershed

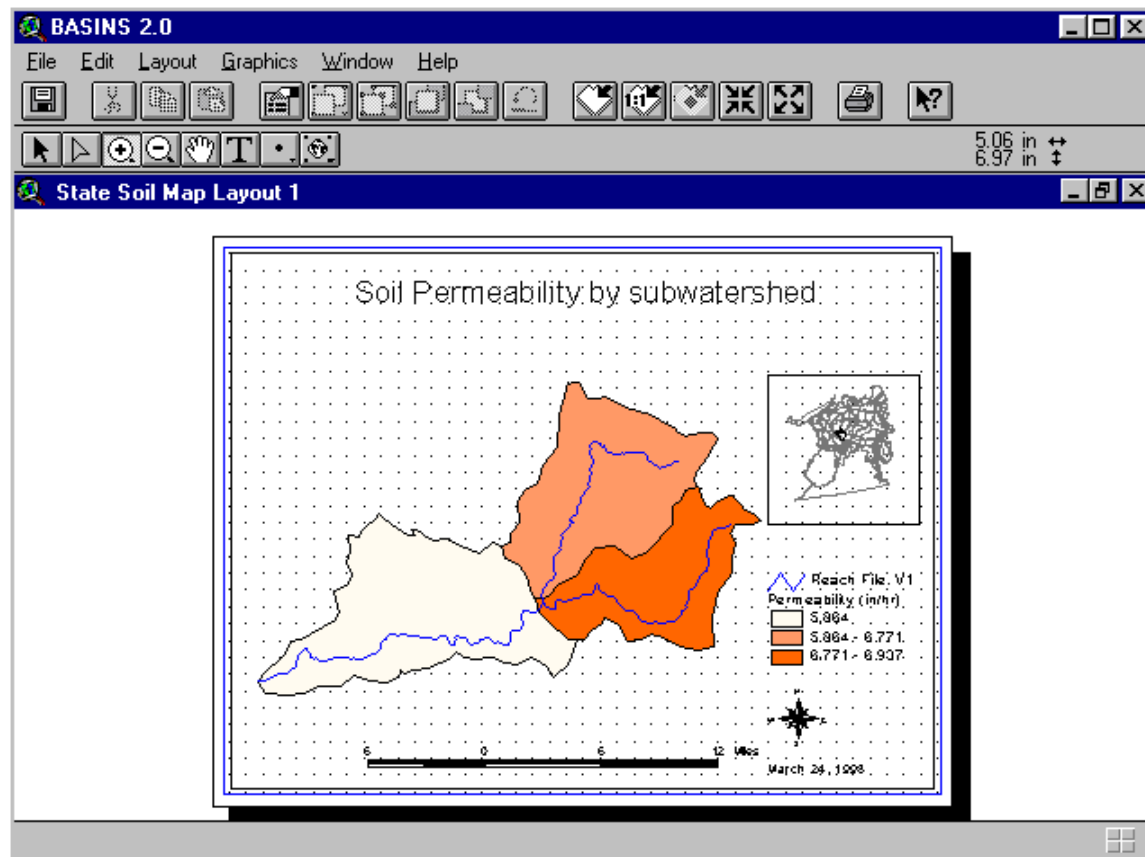
Table xx. Soil statistics - Summary by subwatershed (Parameter: Permeability (in/hr)).

Statistics	05010007014	05010007013	05010007012	Composite
Area (acre)	40177	30207	49818	120203
Mean	6.77	6.94	5.86	6.44
Min	0.00	0.00	0.00	0.00
Max	9.33	9.33	9.33	9.33

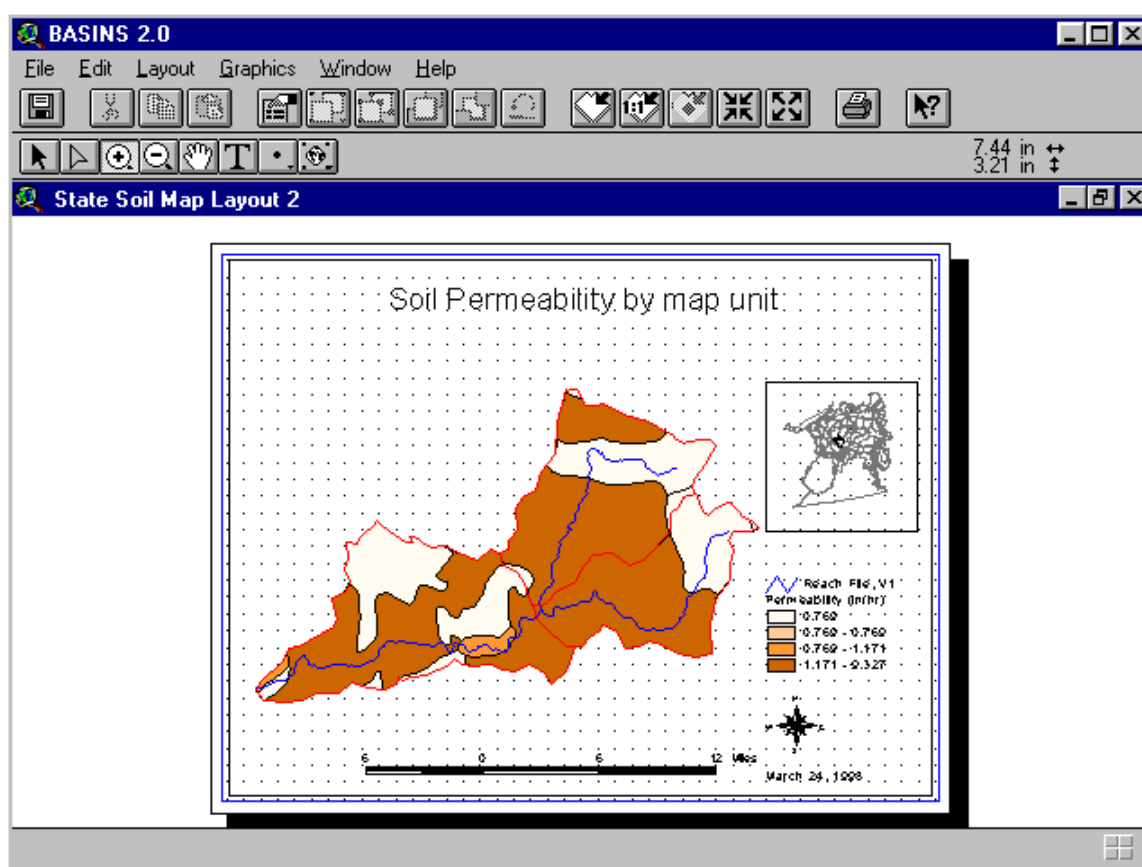
Note: Type of Estimate: Mean; Components: Area-weighted; Layers: Depth-integration.

Screen 8.5.4

The first map layout (State Soil Map Layout 1) shows the spatial distribution of the selected soil parameter by watershed in which one value is assigned for each subwatershed (Screen 8.5.5). The second map layout, "State Soil Map Layout 2," shows the spatial distribution of the selected soil parameter by STATSGO map unit (Screen 8.5.6). On both maps, the Reach File network (RF1 or RF3) is also drawn for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.



Screen 8.5.5



Screen 8.5.6

When the map layout is active, it can be printed through the *Print* submenu under the *File* main menu. The map layout can be activated by clicking on it. Another way to print the map layout is through the **Print** button in the Project Window with the Layouts component selected and the “State Soil Map Layout #” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate a good printout of the BASINS tables, particularly when the tables are large. It is recommended that you use a word processor to import both the tables and maps for printing, further editing and formatting, or incorporation into other documents.

Tip: The files *soil.tx1* and *soil.tx2*, which contain the tables, and *soil.wmf*, which contains the soil map, are located in the `|Basins|WcReport|<StudyArea>|Reports|` directory. The `<StudyArea>` is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.

8.6 Watershed Topographic Report

Purpose

Watershed Topographic Report provides a statistical summary and distribution of discrete land surface elevations in the watershed. It also generates an elevation map of the selected watershed. The default source elevation map in BASINS is derived from the conversion of the USGS one degree Digital Elevation Map (DEM) into a vector map product. The information generated in this report is summarized in table format and, if selected, in map format.

Application

Watershed Topographic Report is a useful tool for characterizing the magnitudes and distribution of elevations in the watershed. Statistical measures of elevation such as minimum, maximum, mean, median, and standard deviation are provided. A graph showing the cumulative percentage of the total area under a particular elevation is generated (hypsometric curve). This information can be used to quickly evaluate the relative “steepness” of the watershed compared to that of other watersheds and to correlate it with the results of water quality modeling. In conjunction with the Reach File data, the DEM data can be used to assist users in delineating watersheds more accurately. Using the **Identify** tool, the user can determine the elevation at key locations such as the headwaters of a stream. The hypsometric curve provides an overall description of the elevation in the watershed and consequently can assist in defining key topographic parameters generally required for water quality and nonpoint source modeling.

Procedures

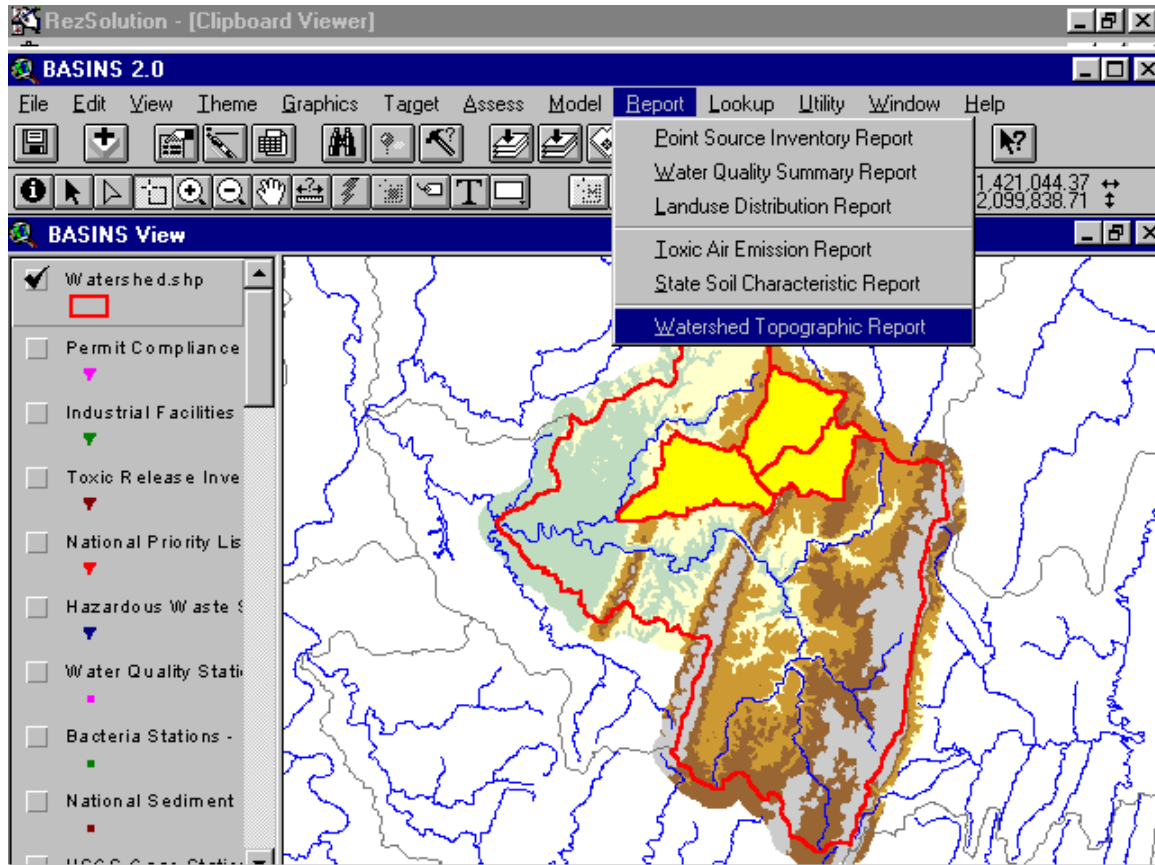
Key Procedures

- ✓ *Activate the watershed boundary theme*
- ✓ *Select the watersheds for which the report will be generated*
- ✓ *Under the Report main menu, select the Watershed Topographic Report submenu*



Operation Steps

1. In BASINS View's Table of Contents (Screen 8.6.1), click the name of the watershed boundary theme to make it active. The watershed boundary theme can be the cataloging unit boundary theme or a user delineated watershed boundary theme.



Screen 8.6.1

2. Activate the **Select Feature** tool and select (by clicking or dragging a box) the watershed(s) for which the land use report will be generated.
3. Under the *Report* main menu, select the *Watershed Topographic Report* submenu. In the text box that appears, enter the map title.
4. Click **OK** to generate the report; otherwise, click **Cancel**.

Tip: The DEM theme for the selected watershed should be available. Since DEM is not a part of the BASINS core data, it has to be imported manually. Default BASINS DEM data that came with the extracted data are stored in \BASINS\Data\<User-Specified Data Directory>\Dem\. The <User-Specified Data Directory> is the directory where the BASINS extracted data are stored, and it was specified during data extraction.

Tip: The BASINS DEM data layer is tiled by watershed (8-digit cataloging unit). Due to the size of each watershed DEM file, it is recommended that you import only the needed files. Refer to Section 7.2 for instructions on how to import DEM files.

TUTORIAL

- Click the theme Watershed.shp to make it active. This demonstrates that the report tools can also be applied to user-delineated watersheds.
- Check its check box to display the boundary theme in the View Window.
- Using the Select Feature tool, select the three delineated subwatersheds. Your BASINS screen should now look like Screen 8.6.1. If necessary, zoom to the study area using the Zoom to Selected Theme tool. This requires that the DEM data for the particular selected subwatersheds have been imported into the BASINS View already.
- Under the Report main menu, select the Watershed Topographic Report submenu.
- In the dialog box that appears, enter the title Land Surface Elevation.
- Click OK to continue.
- Click OK to accept the default directory Watershe where all report files will be saved. The report files dem.* are saved at the \Basins\WcReport\Watershe\Reports\ directory.

Generated Report

The generated report includes a table, chart, and map layout. The table, “Elevation Report” contains the summary statistics of the land surface elevations in the watershed (Screen 8.6.2). It also shows the percent distribution of the total watershed area under a particular elevation. This distribution is plotted in the chart component of the report (Screen 8.6.3). The map layout shows the land surface elevation map in the watershed (Screen 8.6.4). The Reach File network (RF1 or RF3) is also drawn for reference purposes. A map inset is included to show the general location of the selected watershed(s) relative to the EPA regional boundary.

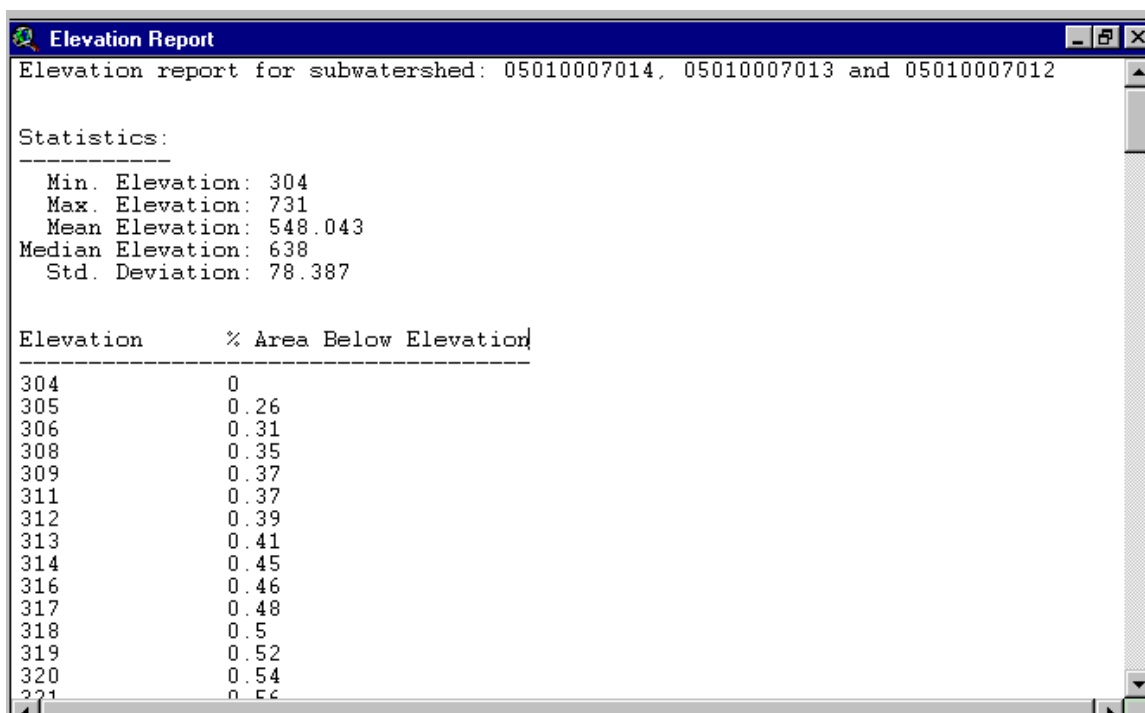
When the map layout is active, it can be printed through the Print submenu under the File main menu. The map layout can be activated by clicking on it. Another way to print the map layout is through the **Print** button in the Project Window with the Layouts component selected and the “Elevation Map” layout highlighted.

The print function that ArcView provides for the tables is intentionally deactivated in BASINS. Since this ArcView print function does not provide any formatting options, it fails to generate a good printout of the

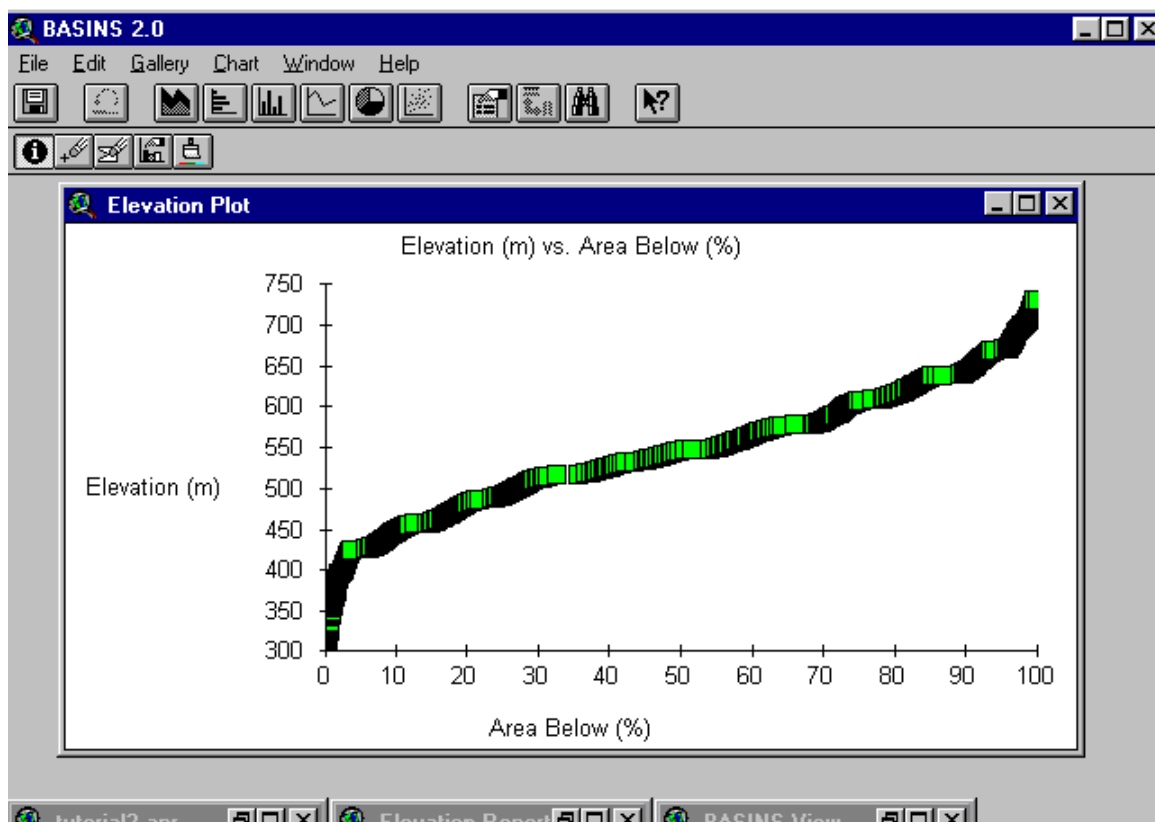


BASINS tables, particularly when the tables are large. It is recommended that you use a word processor to import both the tables and maps for printing, further editing and formatting, or incorporation into other documents.

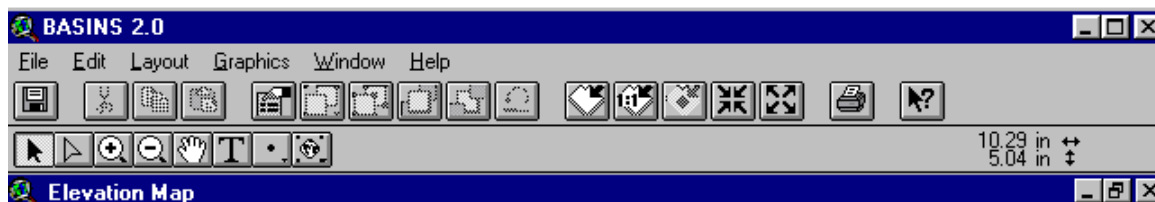
Tip: The file *dem.txt*, which contains the table, and *dem.wmf*, which contains the elevation map, are located in the `|Basins|WcReport|<Study Area>|Reports|` directory. The `<Study Area>` is the user-defined name or identifier given to the study area. It corresponds to the name in the View Table of Contents given to the theme that contains the boundary information of the study area.



Screen 8.6.2



Screen 8.6.3



Screen 8.6.4